

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
18 March 2004 (18.03.2004)

PCT

(10) International Publication Number  
**WO 2004/022462 A3**

(51) International Patent Classification<sup>7</sup>: **B65G 53/52,**  
F15D 1/02

(21) International Application Number:  
PCT/GB2003/003919

(22) International Filing Date:  
9 September 2003 (09.09.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0220814.8 9 September 2002 (09.09.2002) GB

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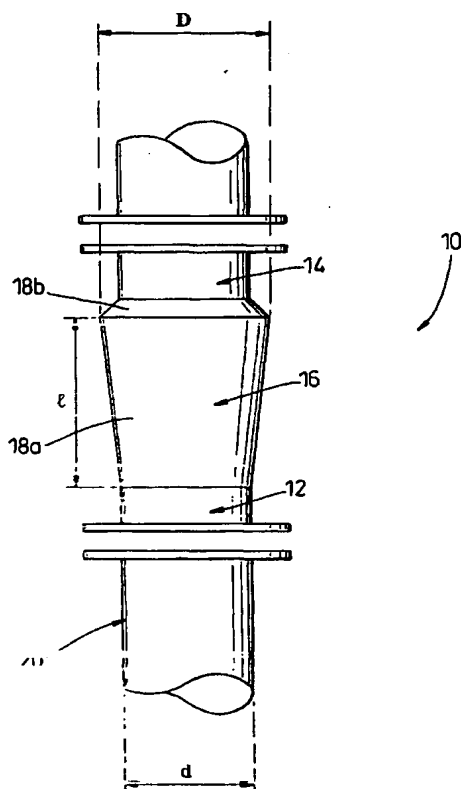
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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: FLOW HOMOGENISER



(57) Abstract: A flow homogeniser (10) for insertion in a pipeline (20) conveying a particulate material carried by a carrier fluid comprising a pipe having an inlet end (12) and an outlet end (14) and including a core (16) defined by one or more core pipe sections (18a, 18b) connected in series between the inlet end and the outlet end, the or each core pipe section defining a relatively gradual or rapid change in cross-sectional area in order to mix particulate material and carrier fluid entering the inlet end to form a homogeneous mixture on exit from the outlet end.

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ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:

24 June 2004

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 B65G53/52 F15D1/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 B65G F15D F23K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 272 755 A (NORTHERN ENG IND) 25 May 1994 (1994-05-25) page 2, line 23 - line 34; figures 2-5 -----	1,3,10, 11
X	DE 22 61 796 A (REIMELT DIETRICH KG) 27 June 1974 (1974-06-27) page 2, paragraph 3 page 4, paragraph 1; figure 1 -----	1-3,5
X	PATENT ABSTRACTS OF JAPAN vol. 010, no. 070 (M-462), 19 March 1986 (1986-03-19) -& JP 60 213624 A (KAWASAKI SEITETSU KK), 25 October 1985 (1985-10-25) abstract ----- -/--	1-3,5

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

13 April 2004

Date of mailing of the international search report

27. 04. 2004

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/03919

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CH 238 569 A (OERLIKON MASCHF) 31 July 1945 (1945-07-31) page 1, line 45 - page 2, line 14 figures 2,3 -----	1-4
X	WO 01/09021 A (KNISS JOCHEN ; WAESCHLE GMBH (DE); STORF ROBERT (DE)) 8 February 2001 (2001-02-08) figures 1,4 -----	1,2,7
X	FR 789 824 A (M. REPESSE) 7 November 1935 (1935-11-07) the whole document -----	1,3,11, 19,21
A	EP 0 179 354 A (PETERS AG CLAUDIUS) 30 April 1986 (1986-04-30) figures 5,7 -----	11
A	EP 0 726 398 A (ORLEV SCIENT COMPUTING LIMITED) 14 August 1996 (1996-08-14) column 14, line 18 - line 27; figure 16 -----	10-17

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/03919

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2272755	A	25-05-1994	NONE	
DE 2261796	A	27-06-1974	DE 2261796 A1	27-06-1974
JP 60213624	A	25-10-1985	NONE	
CH 238569	A	31-07-1945	NONE	
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EP 0726398	A	14-08-1996	CA 2169230 A1 DE 69616103 D1 DE 69616103 T2 EP 0726398 A1 IN 186816 A1 RU 2159363 C2 US 5797414 A	14-08-1996 29-11-2001 06-06-2002 14-08-1996 17-11-2001 20-11-2000 25-08-1998

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 03/03919

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 2-9

A device in accordance with any of claims 2 (as dependent on claim 1) to 9 having an increasing cross-sectional area at the inlet end.

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2. claims: 1, 10-17

A device in accordance with any of claims 10 or 11 (as dependent on claim 1) and 12 to 17 having a flow control system at the inlet or outlet ends.

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3. claims: 1, 18-21

A device in accordance with any of claims 18 or 19 (as dependent on claim 1) 20 and 21 including air jets at the inlet or outlet ends.

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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference GAID/P29174PC	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 03/03919	International filing date (day/month/year) 09/09/2003	(Earliest) Priority Date (day/month/year) 09/09/2002
Applicant: GAIM LTD.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.  
☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☒ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is: Figure No. 1

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.



# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 03/03919

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

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1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 03/03919

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

A flow homogeniser (10) for insertion in a pipeline (20) conveying a particulate material carried by a carrier fluid comprising a pipe having an inlet end (12) and an outlet end (14) and including a core (16) defined by one or more core pipe sections (18a, 18b) connected in series between the inlet end and the outlet end, the or each core pipe section defining a relatively gradual or rapid change in cross-sectional area in order to mix particulate material and carrier fluid entering the inlet end to form a homogeneous mixture on exit from the outlet end.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 2-9

A device in accordance with any of claims 2 (as dependent on claim 1) to 9 having an increasing cross-sectional area at the inlet end.

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## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 03/03919

A. CLASSIFICATION OF SUBJECT MATTER  
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## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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	----- -/-	

☒ Further documents are listed in the continuation of box C.

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## \* Special categories of cited documents:

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- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

13 April 2004

Date of mailing of the international search report

27. 04. 2004

Name and mailing address of the ISA

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Authorized officer

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# INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 03/03919

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 0 179 354 A (PETERS AG CLAUDIUS) 30 April 1986 (1986-04-30) figures 5,7	11
A	EP 0 726 398 A (ORLEV SCIENT COMPUTING LIMITED) 14 August 1996 (1996-08-14) column 14, line 18 - line 27; figure 16	10-17

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/03919

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2272755	A	25-05-1994	NONE	
DE 2261796	A	27-06-1974	DE 2261796 A1	27-06-1974
JP 60213624	A	25-10-1985	NONE	
CH 238569	A	31-07-1945	NONE	
WO 0109021	A	08-02-2001	DE 19936134 C1 DE 10002391 C1 WO 0109021 A1 EP 1117605 A1 JP 2003506290 T	30-11-2000 23-05-2001 08-02-2001 25-07-2001 18-02-2003
FR 789824	A	07-11-1935	NONE	
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EP 0726398	A	14-08-1996	CA 2169230 A1 DE 69616103 D1 DE 69616103 T2 EP 0726398 A1 IN 186816 A1 RU 2159363 C2 US 5797414 A	14-08-1996 29-11-2001 06-06-2002 14-08-1996 17-11-2001 20-11-2000 25-08-1998